

SMF4LxxxXX Series transient voltage suppressors are excellent overvoltage protective devices.

The Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



SOD-123F

Features

- Excellent clamping capability
- Low leakage current
- Low capacitance
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:
typically less than 1.0ps from 0 Volts to V_{BR} min

Mechanical Characteristics

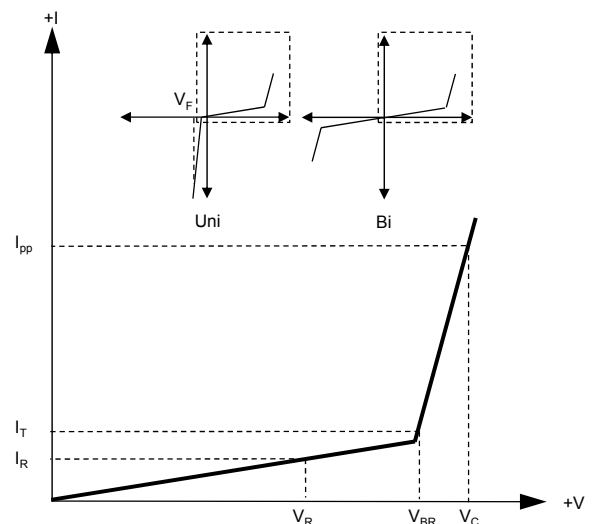
- Package: SOD-123F plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Cellular phones
- Portable devices
- Business machines
- Power supplies
- Consumer applications

Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current)
V_{BR}	Breakdown Voltage - Maximum voltage that flows through the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state


Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOD-123F	Tape/Reel, 13" reel	10000	EIA-481-1
	Tape/Reel, 7" reel	3000	EIA-481-1

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units	Remarks
Peak Pulse Power Dissipation	P_{PPM}	400	W	(Note1)(Note2)
Steady State Power Dissipation	P_D	1	W	(Note3)
Peak Forward Surge Current	I_{FSM}	40	A	(Note4)
Maximum Instantaneous Forward Voltage at 20A	V_{FM}	3.5	V	(Note5)
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	100	$^\circ\text{C/W}$	
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	220	$^\circ\text{C/W}$	
Operating Temperature Range	T_J	-55 to 150	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$	

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 3×3mm to each terminal.

Notes3: Infinite HeatSink at $T_A=50^\circ\text{C}$

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

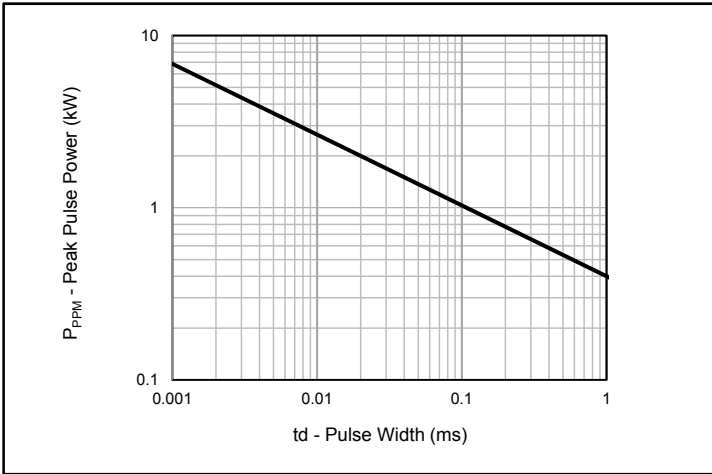
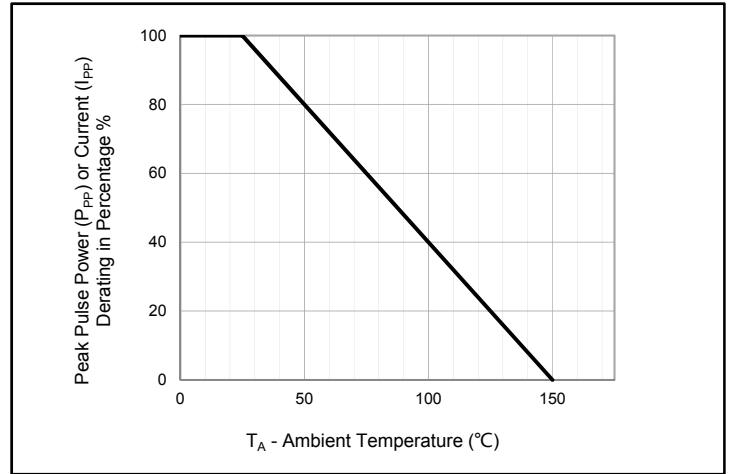
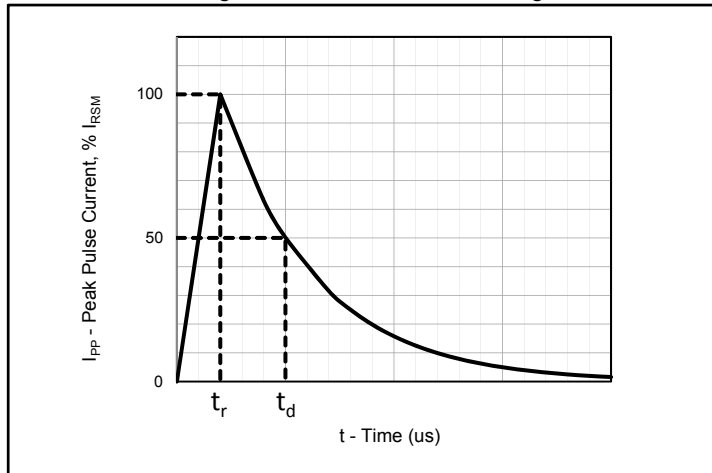
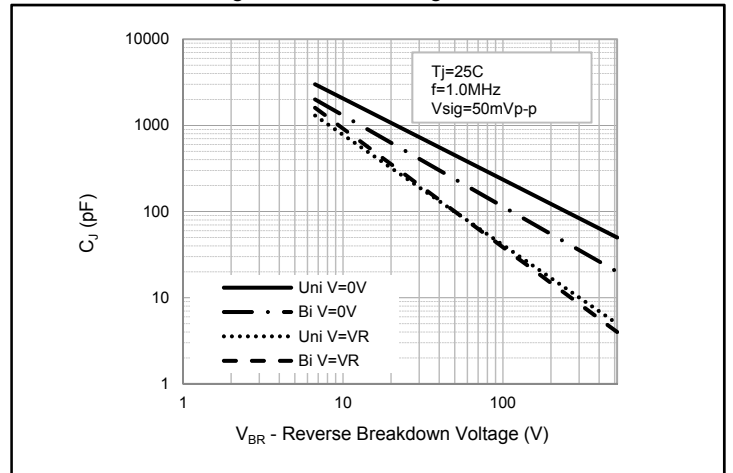
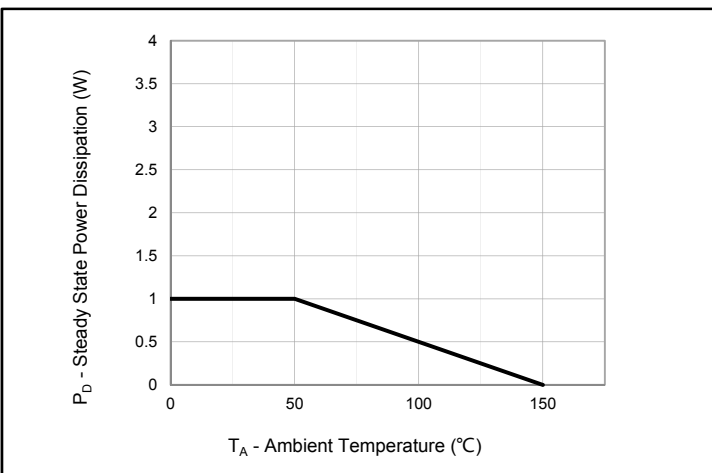
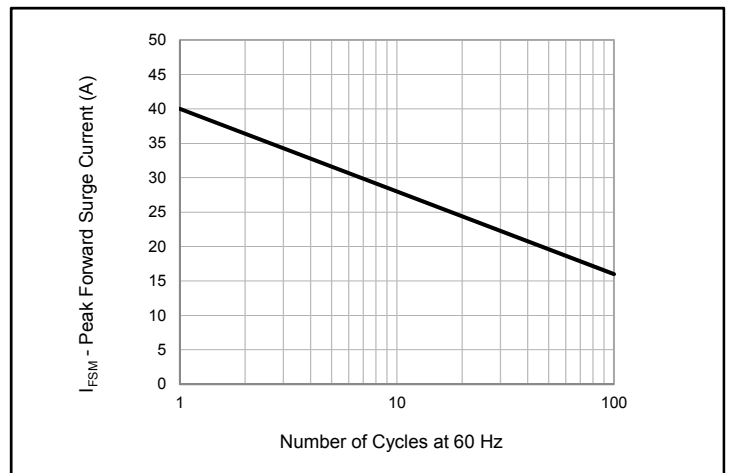
Notes5: For UnidirectionalOnly.

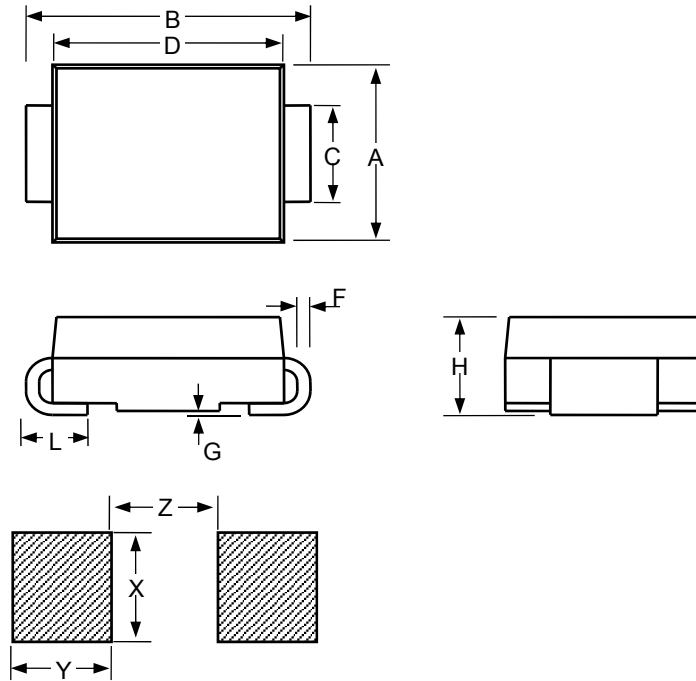
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage $V_{BR} @ I_T$ (V)		Test Current I_T (mA)	Maximum Clamping Voltage $V_C @ I_{PP}$ (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage $I_R @ V_R$ (μA)
		Uni	Bi		Min	Max				
SMAJ5.0A	SMAJ5.0CA	KE	AE	5	6.4	7	10	9.2	43.5	800
SMAJ6.0A	SMAJ6.0CA	KG	AG	6	6.67	7.37	10	10.3	38.8	800
SMAJ6.5A	SMAJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	35.7	500
SMAJ7.0A	SMAJ7.0CA	KM	AM	7	7.78	8.6	10	12	33.3	200
SMAJ7.5A	SMAJ7.5CA	KP	AP	7.5	8.33	9.21	1	12.9	31	100
SMAJ8.0A	SMAJ8.0CA	KR	AR	8	8.89	9.83	1	13.6	29.4	50
SMAJ8.5A	SMAJ8.5CA	KT	AT	8.5	9.44	10.4	1	14.4	27.8	20
SMAJ9.0A	SMAJ9.0CA	KV	AV	9	10	11.1	1	15.4	26	10
SMAJ10A	SMAJ10CA	KX	AX	10	11.1	12.3	1	17	23.5	5
SMAJ11A	SMAJ11CA	KZ	AZ	11	12.2	13.5	1	18.2	22	1
SMAJ12A	SMAJ12CA	LE	BE	12	13.3	14.7	1	19.9	20.1	1
SMAJ13A	SMAJ13CA	LG	BG	13	14.4	15.9	1	21.5	18.6	1
SMAJ14A	SMAJ14CA	LK	BK	14	15.6	17.2	1	23.2	17.2	1
SMAJ15A	SMAJ15CA	LM	BM	15	16.7	18.5	1	24.4	16.4	1
SMAJ16A	SMAJ16CA	LP	BP	16	17.8	19.7	1	26	15.4	1
SMAJ17A	SMAJ17CA	LR	BR	17	18.9	20.9	1	27.6	14.5	1
SMAJ18A	SMAJ18CA	LT	BT	18	20	22.1	1	29.2	13.7	1
SMAJ20A	SMAJ20CA	LV	BV	20	22.2	24.5	1	32.4	12.3	1

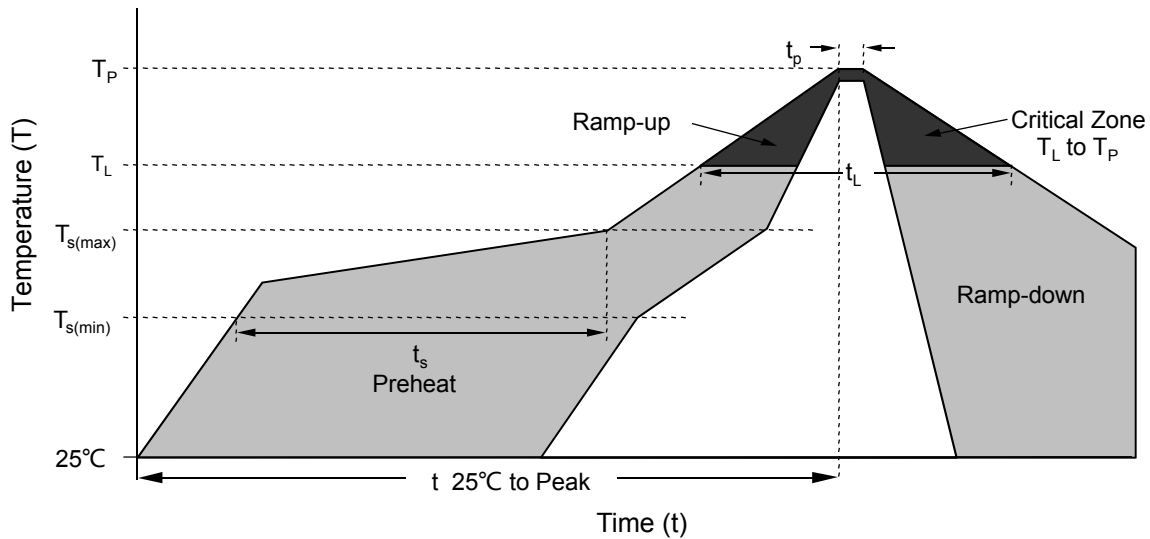
Electrical Characteristics (T_A=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V _R (V)	Breakdown Voltage V _{BR} @ I _T (V)		Test Current I _T (mA)	Maximum Clamping Voltage V _C @ I _{PP} (V)	Maximum Peak Pulse Current I _{PP} (A)	Maximun Reverse Leakage I _R @ V _R (μA)
		Uni	Bi		Min	Max				
SMF4L22A	SMF4L22CA	LX	BX	22	24.4	26.9	1	35.5	11.3	1
SMF4L24A	SMF4L24CA	LZ	BZ	24	26.7	29.5	1	38.9	10.3	1
SMF4L26A	SMF4L26CA	ME	CE	26	28.9	31.9	1	42.1	9.5	1
SMF4L28A	SMF4L28CA	MG	CG	28	31.1	34.4	1	45.4	8.8	1
SMF4L30A	SMF4L30CA	MK	CK	30	33.3	36.8	1	48.4	8.3	1
SMF4L33A	SMF4L33CA	MM	CM	33	36.7	40.6	1	53.3	7.5	1
SMF4L36A	SMF4L36CA	MP	CP	36	40	44.2	1	58.1	6.9	1
SMF4L40A	SMF4L40CA	MR	CR	40	44.4	49.1	1	64.5	6.2	1
SMF4L43A	SMF4L43CA	MT	CT	43	47.8	52.8	1	69.4	5.8	1
SMF4L45A	SMF4L45CA	MV	CV	45	50	55.3	1	72.7	5.5	1
SMF4L48A	SMF4L48CA	MX	CX	48	53.3	58.9	1	77.4	5.2	1
SMF4L51A	SMF4L51CA	MZ	CZ	51	56.7	62.7	1	82.4	4.9	1
SMF4L54A	SMF4L54CA	NE	DE	54	60	66.3	1	87.1	4.6	1
SMF4L58A	SMF4L58CA	NG	DG	58	64.4	71.2	1	93.6	4.3	1
SMF4L60A	SMF4L60CA	NK	DK	60	66.7	73.7	1	96.8	4.1	1
SMF4L64A	SMF4L64CA	NM	DM	64	71.1	78.6	1	103	3.9	1
SMF4L70A	SMF4L70CA	NP	DP	70	77.8	86	1	113	3.5	1
SMF4L75A	SMF4L75CA	NR	DR	75	83.3	92.1	1	121	3.3	1
SMF4L78A	SMF4L78CA	NT	DT	78	86.7	95.8	1	126	3.2	1
SMF4L85A	SMF4L85CA	NV	DV	85	94.4	104	1	137	2.9	1
SMF4L90A	SMF4L90CA	NX	DX	90	100	111	1	146	2.7	1
SMF4L100A	SMF4L100CA	NZ	DZ	100	111	123	1	162	2.5	1
SMF4L110A	SMF4L110CA	PE	EE	110	122	135	1	177	2.3	1
SMF4L120A	SMF4L120CA	PG	EG	120	133	147	1	193	2.1	1
SMF4L130A	SMF4L130CA	PK	EK	130	144	159	1	209	1.9	1
SMF4L150A	SMF4L150CA	PM	EM	150	167	185	1	243	1.6	1
SMF4L160A	SMF4L160CA	PP	EP	160	178	197	1	259	1.5	1
SMF4L170A	SMF4L170CA	PR	ER	170	189	209	1	275	1.5	1

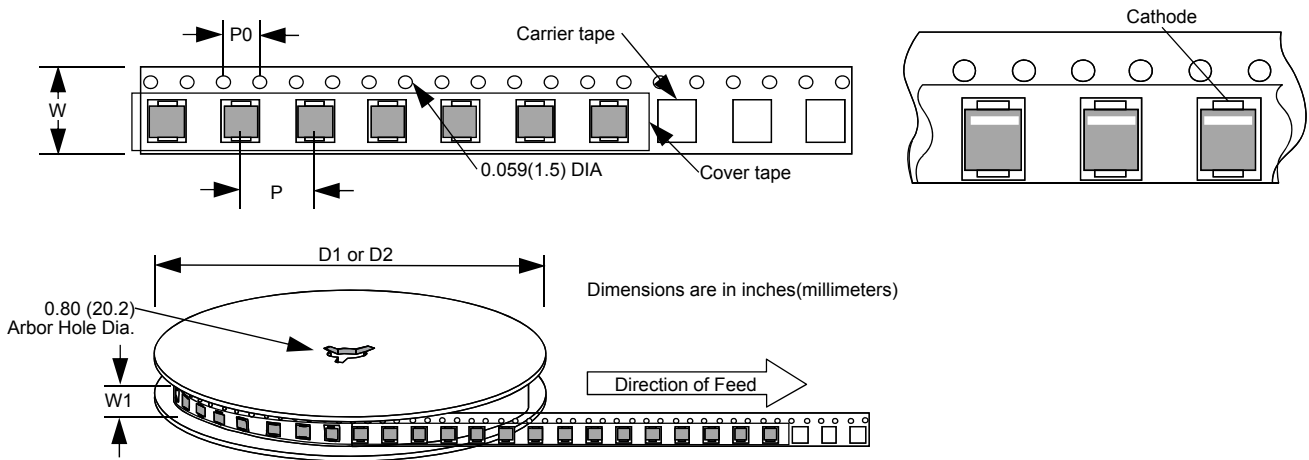

Fig.1 - Peak Pulse Power Rating

Fig.2 - Pulse Derating Curve

Fig.3 - Pulse Waveform

Fig.4 - Typical Junction Capacitance

Fig.5 - Steady State Power Dissipation Derating Curve

**Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current
Uni-Directional Only**



SOD-123F						
Dimension	Inches			Millimeters		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.059		0.079	1.5		2
B	0.134		0.154	3.4		3.9
C	0.028		0.047	0.7		1.2
D	0.098		0.114	2.5		2.9
F	0.002		0.01	0.05		0.26
G	-		0.004	-		0.1
H	0.037		0.053	0.95		1.35
L	0.014		0.035	0.35		0.9
X		0.055			1.4	
Y		0.051			1.3	
Z		0.063			1.6	



Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 secs
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C



Dimension	Inches			Millimeters		
	MIN	NOM	MAX	MIN	NOM	MAX
P		0.157			4	
P0		0.157			4	
W		0.315			8	
W1		0.374			9.5	
D1		7			177.8	
D2		13			330.2	

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